Our Ref.: JBS-42-PCT-US May 24, 2006

English translation of Amendment under PCT Article 34
PCT/JP2004/016007

Please note that we have filed a Demand and a response to the Written Opinion of the International Searching Authority along with an amendment (replacement sheets) under the PCT Article 34(2)(b). Details of the amendments under the PCT Article 34 are as follows:

Amendments to the Description:

Page 15, paragraph No. [0038]

[0038]

The circumferential grooves 31 are straight grooves which are disposed along a circumferential direction of the tread TR10 in parallel or approximately parallel with the tire equator line CL. In addition, as shown in Fig. 2(b), a cross-section of the circumferential groove 31 has a shape that tapers off toward a bottom surface of the grooves. Note that the circumferential grooves 31 are equal to those which are disposed on a tread TR1 of a conventional heavy duty pneumatic tire shown in Fig. 1(c). As shown in Fig. 1(c), the groove deepest portion of the circumferential grooves 31 are 15.5 mm in depth, and angles formed by perpendicular lines P being perpendicular to a surface of the tread TR1 and ~~a bottom surface~~ side walls of the circumferential groove 31 are set to 13°.

Amendments to the Claims:

Claim 3 was added.

[0038]

The circumferential grooves 31 are straight grooves which are disposed along a circumferential direction of the tread TR10 in parallel or approximately parallel with the tire equator line CL. In addition, as shown in Fig. 2(b), a cross-section of the circumferential groove 31 has a shape that tapers off toward a bottom surface of the grooves. Note that the circumferential grooves 31 are equal to those which are disposed on a tread TR1 of a conventional heavy duty pneumatic tire shown in Fig. 1(c). As shown in Fig. 1(c), the groove deepest portion of the circumferential grooves 31 are 15.5 mm in depth, and angles formed by perpendicular lines P being perpendicular to a surface of the tread TR1 and side walls of the circumferential groove 31 are set to 13°.

CLAIMS

1. A pneumatic tire, comprising:

circumferential grooves disposed along a circumferential direction of a tread; and

land portions divided by the circumferential grooves, wherein positions of groove deepest portions in the circumferential grooves vary in a predetermined cycle along the circumferential direction in a width direction of the tread within the circumferential grooves; and

depth direction positions, where a groove bottom surface of the circumferential groove contacts with each of perpendicular lines which are perpendicular or approximately perpendicular to a tread surface and which pass respectively through edges of the land portions on a side of each of the circumferential grooves, as well as angles, which are formed by the perpendicular lines and a section line of a cross-section of the groove bottom surface in the width direction of the tread surface with a vertex in the depth direction positions, vary in the predetermined cycle along the circumferential direction.

2. The pneumatic tire of claim 1 characterized in that when a maximum groove cross-sectional area S is defined as an area of a rectangle formed by each of the edges of the land portions

on the side of the circumferential groove and by points where the perpendicular lines, which are perpendicular or approximately perpendicular to the tread surface and which pass through the edges, intersect perpendicularly with a line which is parallel to the tread surface and tangent to the groove deepest portion, an effective groove cross-sectional area S' corresponding to a portion forming the circumferential groove along the entire circumferential direction satisfies $S' \geq 0.45S$ in the maximum groove cross-sectional area S.

3. (Addendum) The pneumatic tire of claim 1 or 2 characterized in that, when an angle close to a rotation center of the tire is denoted as $\alpha 1$ and an angle close to the tread surface is denoted as $\beta 1$, the angles being respectively formed, with a vertex in the depth direction position, by one of the perpendicular lines and the section line of the cross-section of the groove bottom surface in the width direction, at which the groove bottom surface contacts with the perpendicular line passing through the edge of the land portion disposed on the shoulder side of the tread, and when an angle close to the rotation center of the tire is denoted as $\alpha 2$ and an angle close to the tread surface is denoted as $\beta 2$, the angles being respectively formed, with a vertex in the depth direction position, by the other of the perpendicular line and the section line of the cross-section of the groove bottom surface in the width direction, at which the groove bottom surface contacts with the perpendicular

line passing through an edge of a second land portion which is the land portion disposed on a center side of the tread, a relationship $\alpha 2<\beta 2$ is satisfied in a region where a relationship $\alpha 1>\beta 1$ is satisfied, and a relationship $\alpha 2>\beta 2$ is satisfied in a region where a relationship $\alpha 1<\beta 1$ is satisfied.